AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims

Claim 1 (Currently amended): A flexible unbonded pipe, said pipe comprising at least one polymer layer having a thickness of 4 mm or more, at least one film layer having a thickness of greater than 0 mm and 1 mm or less, and one or more armouring layers, said polymer layer being at least 10 times as thick as the film, said film layer providing a fluid permeation barrier against one or more of the fluids methane, hydrogen sulphides, carbon dioxides and water, which is higher than the fluid permeation barrier provided by the polymer layer determined at 50 °C and a pressure difference of 50 bar, and said polymer layer being bonded to said film layer via one or more bondings selected from the group of chemical bondings and physical bondings,

wherein said armouring layers are not bonded to ~~neither~~ said polymer layer~~ nor said film layer~~, and said armouring layers are not bonded to each other, and

wherein said film layer and said polymer layer are of different materials.

Claim 2 (Previously presented): A flexible pipe according to claim 1 wherein the polymer layer comprises one or more of the polymers selected from the group consisting of polyolefins; polyamide; polyimide (PI); polyurethanes; polyureas; polyesters; polyacetals; polyethers; polyoxides; polysulfides; polysulphones; polyacrylates; polyethylene terephthalate (PET); polyether-ether-ketones (PEEK); polyvinyls; polyacrylonitrils; polyetherketoneketone (PEKK); copolymers of the preceding and fluorous polymers.

Claim 3 (Previously presented): A flexible pipe according to claim 2 wherein the polymer layer comprises cross-linked polyethylene (XLPE).

Claim 4 (Withdrawn): A flexible pipe according to claim 1 wherein the film layer is of a material selected from the group consisting of polymer, metal, metal containing compositions and combinations thereof.

Claim 5 (Withdrawn): A flexible pipe according to claim 4 wherein the film layer is a polymer film comprising one or more of the polymer material selected from the group consisting of

polyolefins; polyamide; polyimide (PI); polyurethanes; polyureas; polyesters; polyacetals; polyethers; polyoxides; polysulfides; polysulphones; polyacrylates; polyethylene terephthalate (PET); polyether-ether-ketones (PEEK); polyvinyls; polyacrylonitrils; polyetherketoneketone (PEKK); copolymers of the preceding and fluorous polymers.

Claim 6 (Withdrawn): A flexible pipe according to claim 4 wherein the film layer is a metal film selected from the group consisting of aluminum, stainless steel and duplex.

Claim 7 (Withdrawn): A flexible offshore pipe according to claim 4 wherein the film layer is a layered material comprising at least one metal layer.

Claim 8 (Withdrawn): A flexible pipe according to claim 4 wherein the film layer comprises metal-containing compositions.

Claim 9 (Withdrawn): A flexible pipe according to claim 4 wherein the film layer comprises a mixture of polymer with particles selected from the group consisting of carbon

particles, metal particles, metal-containing particles, and mixtures thereof.

Claim 10 (Cancelled):

Claim 11 (Previously presented): A flexible pipe according to claim 1 wherein the polymer layer is bonded to the film layer via one or more bondings comprising at least one of the chemical bondings selected from the group of ion bondings and covalent bondings.

Claim 12 (Previously presented): A flexible pipe according to claim 1 wherein the bonding between the polymer layer and the film layer is stronger than the internal bondings in one of the polymer layer and the film layer.

Claim 13 (Previously presented): A flexible pipe according to claim 12 wherein the film layer is a layered material, and all interface bondings including bondings between layers of the film and bonding between the polymer layer and the film layer, are stronger than the internal bondings in one of the polymer layer and the film layer.

Claim 14 (Previously presented): A flexible pipe according to claim 12 wherein the interface bonding(s) is/are stronger than the internal bonding of the polymer layer.

Claim 15 (Previously presented): A flexible pipe according to claim 1 wherein the interfacial bonding between the polymer layer and the film layer is sufficiently strong to prevent creation of gas pockets between the layers when subjected to an increased carbon dioxides pressure on the film side of the pipe.

Claim 16 (Previously presented): A flexible pipe according to claim 1 wherein the bonding between the polymer layer and the film layer has a peel strength using ASTM D3330 of at least 300 N/m.

Claim 17 (Previously presented): A flexible pipe according to claim 1 wherein the bonding between the polymer layer and the film layer is stronger than the cohesive forces in one of the polymer layer and the film layer measured by 90° peel test.

Claim 18 (Previously presented): A flexible pipe according to claim 1 wherein the surface of the film facing the polymer layer comprises a primer.

Claim 19 (Previously presented): A flexible pipe according to claim 1 wherein the polymer layer has a thickness between 4 and 20 mm.

Claim 20 (Cancelled):

Claim 21 (Currently amended): A flexible pipe according to claim 1 wherein the film layer has a thickness of about 25 μm or more and 1 mm or less.

Claim 22 (Previously presented): A flexible pipe according to claim 1 wherein the film layer provides a fluid permeation barrier against at least one of the fluids selected from methane, hydrogen sulphides, carbon dioxides and water, which is at least 50% higher than the fluid permeation barrier provided by the polymer layer determined at 50 °C and a pressure difference of 50 bar.

Claim 23 (Previously presented): A flexible pipe according to claim 1 wherein the film layer provides a fluid permeation barrier against all of the fluids methane, hydrogen sulphides, carbon dioxides and water, which is higher than the fluid permeation barrier provided by the polymer layer determined at 50 °C and a pressure difference of 50 bar.

Claim 24 (Previously presented): A flexible pipe according to claim 22 wherein the film layer is essentially impermeable to at least one of the fluids selected from hydrogen sulfides, methane, and carbon dioxide, at a partial pressure for the respective fluid on a first side of the layer of at least 0.03 bars measured at about 50 °C and a pressure difference of 50 bar.

Claim 25 (Previously presented): A flexible pipe according to claim 22 wherein the film layer is essentially impermeable to H_2O, measured at about 50 °C and a pressure difference of 50 bar.

Claim 26 (Previously presented): A flexible pipe according to claim 22 wherein the film layer is essentially impermeable to hydrogen sulfides at a partial pressure of at least 0.03 bars at a temperature of about 25 °C and a pressure difference of 50 bar.

Claim 27 (Previously presented): A flexible pipe according to claim 22 wherein the film layer is essentially impermeable to methane at a partial pressure of at least 1 bar at a temperature of about 25 °C and a pressure difference of 50 bar.

Claim 28 (Previously presented): A flexible pipe according to claim 22 wherein the film layer is essentially impermeable to carbon dioxide, at a partial pressure of at least 1 bar at a temperature of about 25 °C and a pressure difference of 50 bar.

Claim 29 (Previously presented): A flexible pipe according to claim 1 wherein said film layer is the innermost layer of said film layer and said polymer layer.

Claim 30 (Withdrawn): A flexible pipe according to claim 1 wherein said film layer is sandwiched between two polymer layers, at least one of the polymer layers being bonded to the film layer, with a bonding that is stronger than the internal cohesion of said polymer layer.

Claim 31 (Previously presented): A flexible pipe according to claim 1 wherein said film layer is sandwiched between two polymer layers, and the innermost polymer layer of the two polymer layers is selected from the group consisting of polyolefins; polyamide; polyimide (PI); polyurethanes; polyureas; polyesters; polyacetals; polyethers; polyoxides; polysulfides; polysulphones; polyacrylates; polyethylene terephthalate (PET); polyether-ether-ketones (PEEK); polyvinyls; polyacrylonitrils; polyetherketoneketone (PEKK); copolymers of the preceding and fluorous polymers.

Claim 32 (Original): A flexible pipe according to claim 31 wherein the innermost polymer layer of the two polymer layers being PVDF and the polymer layer on the in radial direction outermost of the two polymer layer is cross-linked polyethylene (XLPE).

Claim 33 (Original): A flexible pipe according to claim 31 wherein the innermost polymer layer of the two polymer layers is cross-linked polyethylene (XLPE).

Claim 34 (Previously presented): A flexible pipe according to claim 1 wherein the film layer is in the form of a tape wound around an innermost polymer layer.

Claim 35 (Previously presented): A flexible pipe according to claim 1 wherein the film layer is in the form of a tape folded around an innermost polymer layer.

Claim 36 (Previously presented): A flexible pipe according to claim 1 wherein said film layer comprises C atoms, the polymer being a cross-linked polymer with bondings linking to the C atoms of the film layer.

Claim 37 (Withdrawn): A flexible pipe according to claim 1 wherein said pipe comprises one or more innermost unbonded armouring layers (carcass).

Claim 38 (Previously presented): A flexible pipe according to claim 1 wherein at least one of said armouring layers is on the outer side of the polymer layer bonded to said film layer.

Claim 39 (Withdrawn): A method of producing a flexible unbonded pipe, said pipe comprises at least one polymer layer having a thickness of 4 mm or more and at least one film layer having a thickness of 1 mm or less, said polymer layer being at least 10 times as thick as the film, said film layer providing a fluid permeation barrier against one or more of the fluids methane, hydrogen sulphides, carbon dioxides and water, which is higher than the fluid permeation barrier provided by the polymer layer determined at 50 °C and a pressure difference of 50 bar, the method comprises the steps of providing at least one polymer layer and at least one film layer and bonding said layers to each other.

Claim 40 (Withdrawn): A method according to claim 39 said method comprises the steps of

-providing an innermost polymer layer using a method selected from extrusion, winding, or wrapping,

-providing a film layer around said innermost polymer layer using a method selected from extrusion, winding, or wrapping,

-providing a second polymer layer around said film layer, and

-providing a bonding between at least one of said polymer layers and said film layer.

Claim 41 (Withdrawn): A method according to claim 39 said method comprising the steps of

-providing a film layer around a mandrel or an inner armour layer (carcass), using a method selected from extrusion, winding and wrapping,

-providing a polymer layer around said film layer by extrusion, and

-providing a bonding between said polymer layer and said film layer.

Claim 42 (Withdrawn): A method according to claim 39, said method comprising the steps of

-providing an innermost layered section of the flexible pipe comprising at least an innermost polymer layer and an armour layer on the outer side of said innermost polymer layer,

-providing a film layer around said innermost layered section of the flexible pipe, providing an outer polymer layer around said film layer, and

-providing a bonding between at least one of said polymer layers and said film layer.

Claim 43 (Withdrawn): A method according to claim 39 wherein the film layer is treated by corona or by application of a primer for increasing bonding strength.

Claim 44 (Withdrawn): A method according to claim 39 wherein the film layer or a primer coated onto said film layer comprises C atoms.

Claim 45 (Cancelled):

Claim 46 (Withdrawn): A method according to claim 39 wherein the film layer comprises a metal tape with a primer.

Claim 47 (Withdrawn): A method according to claim 40 wherein said bonding is provided by subjecting said at least one polymer layer to cross-linking.

Claim 48 (Withdrawn): A method according to claim 42 wherein said bonding is provided by cross-linking of said polymer layer.

Claim 49 (Withdrawn): A method according to claim 42 wherein said bonding is provided by subjecting said polymer layer to cross-linking.

Claim 50 (Currently amended): A flexible unbonded pipe, said pipe comprising at least one polymer layer, at least one film layer, and one or more armouring layers, said film layer being a metal film layer and said polymer layer being bonded to said film layer via one or more bondings selected from the group of chemical bondings and physical bondings,

wherein said armouring layers are not bonded to ~~neither~~ said polymer layer ~~nor said film layer~~, and said armouring layers are not bonded to each other, and

wherein said film layer and said polymer layer are of different materials.

Claim 51 (Currently amended): A flexible unbonded pipe, said pipe comprising at least one polymer layer, at least one film layer, and one or more armouring layers, said polymer layer being bonded to said film layer via one or more bondings selected from the group of chemical bondings and physical bondings, and the interfacial bonding between the polymer layer and the film layer

being sufficiently strong to prevent creation of gas pockets between the layers when subjected to an increased carbon dioxide pressure of 5 bar on the film side of the pipe,

wherein said armouring layers are not bonded to ~~neither~~ said polymer layer ~~nor said film layer~~, and said armouring layers are not bonded to each other, and

wherein said film layer and said polymer layer are of different materials.

Claim 52 (Previously presented): A flexible unbonded pipe according to claim 50, wherein the bonding between the polymer layer and the film layer has a peel strength using ASTM D3330 of at least 300 N/m.

Claim 53 (Currently amended): A flexible unbonded pipe, said pipe comprising at least one polymer layer, at least one film layer, and one or more armouring layers, said polymer layer being thicker than said film layer, said film layer being a wounded or folded film layer, and said polymer layer being bonded to said film layer via one or more bondings selected from the group of chemical bondings and physical bondings,

wherein said armouring layers are not bonded to ~~neither~~ said polymer layer ~~nor said film layer~~, and said armouring layers are not bonded to each other, and

wherein said film layer and said polymer layer are of different materials.

Claim 54 (Currently amended): A flexible unbonded pipe, said pipe comprising at least one polymer layer, at least one film layer, and one or more armouring layers, said polymer layer being a cross-linked polyethylene and said polymer layer being bonded to said film layer via one or more bondings selected from the group of chemical bondings and physical bondings, and said bondings being established by the cross-linking of the polyethylene,

wherein said armouring layers are not bonded to ~~neither~~ said polymer layer ~~nor said film layer~~, and said armouring layers are not bonded to each other, and

wherein said film layer and said polymer layer are of different materials.